

REMARKS

Claims 1-20 are all the claims presently pending in the application. Claims 1-3, 6, and 7 are amended to more particularly define the claimed invention. Claims 18-20 are added to claim additional features of the claimed invention. No new matter is added.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-5 and 8-15 stand rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite.

With respect to the prior art, claims 1-3, 8, 12, and 13 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by Kase et al. (U.S. Patent Publication No. 2002/0050154 A1) and under 35 U.S.C. § 102 (a) and (e) as being allegedly anticipated by Roba et al. (U.S. Patent Publication No. 2004/0237594 A1).

Claims 6, 7, 16, and 17 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by, or, in the alternative, under 35 U.S.C. § 103(a) as being allegedly unpatentable over Kase. Claims 6 and 7 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by, or, in the alternative, under 35 U.S.C. § 103(a) as being allegedly unpatentable over Roba.

Claims 5, 9, 10, and 15 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Kase. Claims 4, 11, and 14 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Kase in view of Nozawa (Japan Publication No. 07-101745). Claims 5, 9, 10, and 15 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Roba.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary aspect of the claimed invention (e.g. as recited in claim 1) is directed to a manufacturing apparatus for a porous glass base material, including a burner repeatedly reciprocating in a direction along a longitudinal direction of an axially rotating base member glass rod, the burner ejecting and depositing glass particles onto the base member glass rod, and an exhaust hood positioned above a porous glass soot formed by the deposition of the glass particles, the exhaust hood repeatedly reciprocating in the same direction as the burner and in synchronization with the burner. The exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot perpendicular to a central axis of the porous glass soot is surrounded.

Another exemplary aspect of the claimed invention (e.g. as recited in claim 6) is directed to a manufacturing apparatus of a porous glass base material, including a burner repeatedly reciprocating in a direction along a longitudinal direction of an axis-rotating base member glass rod, the burner ejecting and depositing glass particles onto the base member glass rod, and an exhaust hood positioned above a porous glass soot formed by the deposition of the glass particles, the exhaust hood repeatedly reciprocating in the same direction as the burner and in synchronization with the burner. $0.5 < r/R < 1.5$, when r denotes an offset between (i) an extended line of a line connecting a central axis of the burner and a central axis of the porous glass soot and (ii) a central axis line of an exhaust pipe of the exhaust hood which is parallel to the extended line, and R denotes a radius of the exhaust pipe.

Conventional optical-fiber glass base materials of increasingly larger size have been developed, and porous glass soots, that is to say, the semi-finished products, accordingly grow in

size. As the diameter of a porous glass soot increases, a flame flow becomes more disturbed when hitting against the deposition surface of the porous glass soot. Here, non-deposited glass articles, the linear velocity of which decreases, move upwards in the vertical direction and are not exhausted from the exhaust hood very well. Consequently, the gas flow is disturbed, which causes the following problems. For example, the soot may break, or bubbles may be created because the nondeposited glass particles are later deposited onto the porous glass soot. (Application at paragraph [0006]).

On the other hand, an exemplary aspect of the claimed invention may include a manufacturing apparatus of a porous glass base material, where the exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot perpendicular to a central axis of the porous glass soot is surrounded (Application at paragraph [0008]) or a manufacturing apparatus of a porous glass base material, where $0.5 < r/R \leq 1.5$, when r denotes an offset between (i) an extended line of a line connecting a central axis of the burner and a central axis of the porous glass soot and (ii) a central axis line of an exhaust pipe of the exhaust hood which is parallel to the extended line, and R denotes a radius of the exhaust pipe (Application at paragraph [0030]). These exemplary features may provide a manufacturing apparatus of a porous glass base material which can maintain an excellent exhaust gas flow even when a porous glass soot with a large diameter is manufactured (Application at paragraph [0007]).

II. THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION

The Examiner alleges that “corresponding to an angle θ of 100° or more with respect to a central axis of the porous glass soot”, as previously recited in claim 1, is unclear as to what θ measures, thus allegedly making claims 1-5 and 8-15 indefinite

While Applicants respectfully submits that one of ordinary skill in the art would clearly understand claims 1-5 and 8-15 as previously presented, to expedite prosecution, claim 1 is amended to recite that “the exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot perpendicular to a central axis of the porous glass soot is surrounded.” Applicants respectfully submit that the amendment of claim 1 clearly alleviates all of the Examiner’s concerns.

Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

III. THE PRIOR ART REJECTIONS

A. The Kase and Roba References with respect to the Invention of Claim 1

Kase is related to an apparatus for grinding a glass based material having a core and a clad (Kase at Abstract). Roba is related to a method and device for manufacturing a preform for optical fibers (Roba at Abstract). The Examiner alleges that both Kase and Roba anticipate the invention of claim 1. However, Applicants respectfully submit that both Kase and Roba fail to teach each and every element of the invention of claim 1.

Specifically, both Kase and Roba fail to teach or suggest a manufacturing apparatus of a porous glass base material, “wherein the exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot perpendicular to a central axis of the porous glass soot is surrounded”, as recited, for example, in claim 1 (Application at paragraph [0008]). As previously mentioned, this exemplary feature may provide a manufacturing apparatus of a porous glass base material which can maintain an excellent exhaust gas flow even when a porous glass soot with a large diameter is manufactured (Application at paragraph [0007]).

The Examiner alleges that the exhaust hood 26 of Kase corresponds to the exhaust hood of the invention of claim 1. However, Kase clearly fails to teach or suggest the angle θ of the invention of claim 1. Indeed, Kase fails to even teach or suggest the relevant dimensions of the exhaust hood 26. Moreover, applying the angle θ of the invention of claim 1 to Figure 1 of Kase, assuming (arguendo) the exhaust hood 26 is roughly as “deep” in the direction perpendicular to the plane of the figure as it is “wide” in the direction of the arrows, results in a value of θ that is clearly less than 90°. Thus, Kase clearly fails to teach or suggest a manufacturing apparatus of a porous glass base material, where the exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot perpendicular to a central axis of the porous glass soot is surrounded.

Alternatively, the Examiner alleges that the suction element 6 of Roba corresponds to the exhaust hood of the invention of claim 1. However, Roba clearly fails to teach or suggest the angle θ of the invention of claim 1. The relevant dimension of the suction element 6 is taught in Figures 5 and 6 of Roba and is clearly smaller than the dimension of the suction element 6 taught in Figure 8, which is unrelated to the angle θ of the invention of claim 1. Indeed, applying the angle θ of the invention of claim 1 to Figures 5 and 6 of Roba (estimating where the preform 400 might be positioned in relation to the suction element 6) results in an approximate value of θ that is less than 90°. Of course, the actual value of θ is entirely absent from Roba and not clearly discernable from the figures of Roba. Thus, Roba clearly fails to teach or suggest a manufacturing apparatus of a porous glass base material, where the exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot perpendicular to a central axis of the porous glass soot is surrounded.

Therefore, in view of the above, Kase and Roba each fail to teach or suggest each and every feature of the invention of claim 1 and fail to teach or suggest each and every feature of the

invention of claims 2-5 and 8-15. Thus, the invention of claims 1-3, 8, 12, and 13 is not anticipated by Kase or Roba. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

B. The Kase and Roba References with respect to the Invention of Claim 6

The Examiner also alleges that both Kase and Roba anticipate, or, in the alternative, make obvious the invention of claim 6. However, Applicants respectfully submit that both Kase and Roba fail to teach each and every element of the invention of claim 6.

Specifically, both Kase and Roba fail to teach or suggest a manufacturing apparatus of a porous glass base material, “wherein $0.5 < r/R \leq 1.5$, when r denotes an offset between (i) an extended line of a line connecting a central axis of the burner and a central axis of the porous glass soot and (ii) a central axis line of an exhaust pipe of the exhaust hood which is parallel to the extended line, and R denotes a radius of the exhaust pipe”, as recited, for example, in claim 6 (Application at paragraph [0030]). As previously mentioned, this exemplary feature may provide a manufacturing apparatus of a porous glass base material which can maintain an excellent exhaust gas flow even when a porous glass soot with a large diameter is manufactured (Application at paragraph [0007]). Indeed, under these conditions, the soot did not break, and the porous glass base material manufactured by the manufacturing apparatus did not have a bubble, which can be created if the non-deposited glass particles are later deposited.

The Examiner alleges that the smallest deviation of the exhaust hoods of Kase and Roba would result in an r/R ratio slightly above 0. (Office Action at page 6, first paragraph and page 8, first paragraph). However, neither Kase nor Roba teaches or suggests the feature of “ $0.5 \leq r/R \leq 1.5$ ” as claimed. Moreover, even assuming (*arguendo*) that the smallest deviation would result in an r/R ratio slightly above 0, as alleged by the Examiner, in view of the feature of “ $0.5 \leq r/R \leq$

1.5," it would not have been obvious for a person having ordinary skill in the art to modify the teaching of Kase or Roba to arrive at the invention of claim 6.

Thus, the invention of claim 6 is patentable over both Kase and Roba, and the invention of claims 7, 16, and 17 is patentable at least by virtue of its dependence from the invention of claim 6. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

C. The Nozawa Reference

To make up for the deficiencies of Kase, the Examiner applies Nozawa. Nozawa discloses a glass forming method (Nozawa at Abstract). The Examiner alleges that the combination of Kase and Nozawa make the invention of claim 1 obvious.

However, even assuming (arguendo) that one of ordinary skill in the art would combine Kase and Nozawa, the resultant combination fails to teach or suggest a manufacturing apparatus of a porous glass base material, "wherein the exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot is perpendicular to a central axis of the porous glass soot is surrounded", as recited, for example, in claim 1 (Application at paragraph [0008]).

The Examiner alleges that Figure 1 of Nozawa "shows that the exhaust hood contains a mechanism to fold the exhaust pipe (41) to adjust the angle corresponding to a central axis of the porous soot." (Office Action at page 7, third paragraph). However, Nozawa clearly fails to teach or suggest the aforementioned deficiencies of Kase. In particular, Nozawa fails to teach or suggest a manufacturing apparatus of a porous glass base material, where the exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot is perpendicular to a central axis of the porous glass soot is

surrounded, evidenced in part by the fact that the Examiner does not allege that Nozawa teaches or suggests this feature.

In addition, Nozawa is written entirely in Japanese. The Examiner does not rely on the English abstract of Nozawa, and instead completely and solely relies on the figures of Nozawa.

Applicant reminds the Examiner that MPEP 706.02(II) states that

[c]itation of and reliance upon an abstract without citation of and reliance upon the underlying scientific document is generally inappropriate where both the abstract and the underlying document are prior art. See *Ex parte Jones*, 62 USPQ2d 1206, 1208 (Bd. Pat. App. & Inter. 2001) (unpublished). To determine whether both the abstract and the underlying document are prior art, a copy of the underlying document must be obtained and analyzed. If the document is in a language other than English and the examiner seeks to rely on that document, a translation must be obtained so that the record is clear as to the precise facts the examiner is relying upon in support of the rejection. The record must also be clear as to whether the examiner is relying upon the abstract or the full text document to support a rejection. (emphasis added)

Thus, whether the Examiner uses translated text of the reference, the abstract of the reference, or the drawings of the reference, the Examiner must be able to provide the precise facts relied upon in support of the rejection. Indeed and certainly, if the Examiner is utilizing a portion of a foreign language reference other than an English-language abstract or a translated portion of the foreign language reference, a translation must be obtained.

In view of MPEP 706.02(II), the Examiner's aforementioned alleged statement applying Nozawa with respect to the exemplary feature is completely unreasonable. One of ordinary skill in the art would clearly not be able to use Figure 1 of Nozawa to teach or suggest a manufacturing apparatus of a porous glass base material, where the exhaust hood surrounds a portion of the porous glass soot such that an angle θ of 100° or more of a cross section of the porous glass soot perpendicular to a central axis of the porous glass soot is surrounded. Thus, Nozawa clearly fails to make up for the deficiencies of Kase with respect to the invention of claim 1.

Therefore, Nozawa, whether applied alone or (arguendo) in combination, fails to teach or suggest the aforementioned exemplary feature of the invention of claim 1. For at least this reason, the combination of features in the invention of claim 1 would not have been obvious to a person having ordinary skill in the art in view of the combination of Kase and Nozawa. Thus, the invention of claim 1 is patentable over both Kase and Nozawa, and the invention of claims 4, 5, 9-11, 14, and 15 is patentable at least by virtue of its dependence from the invention of claim 1.

Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

IV. NEW CLAIMS

New claims 18-20 are added to claim additional features of the invention and to provide more varied protection for the claimed invention. These claims are independently patentable because of the novel and nonobvious features recited therein.

Applicants submit that the new claims are patentable over the cited prior art references at least for analogous reasons to those set forth above with respect to claims 1 and 6.

V. FORMAL MATTERS AND CONCLUSION

With respect to the drawing objections, while Applicants respectfully submit that one having ordinary skill in the art would clearly understand all of the drawings as previously presented, to expedite prosecution, Figures 1 and 2 and paragraph [0023] of the specification are amended to alleviate the Examiner's concerns.

In view of the foregoing, Applicants submit that claims 1-20, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition

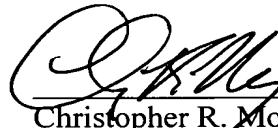
for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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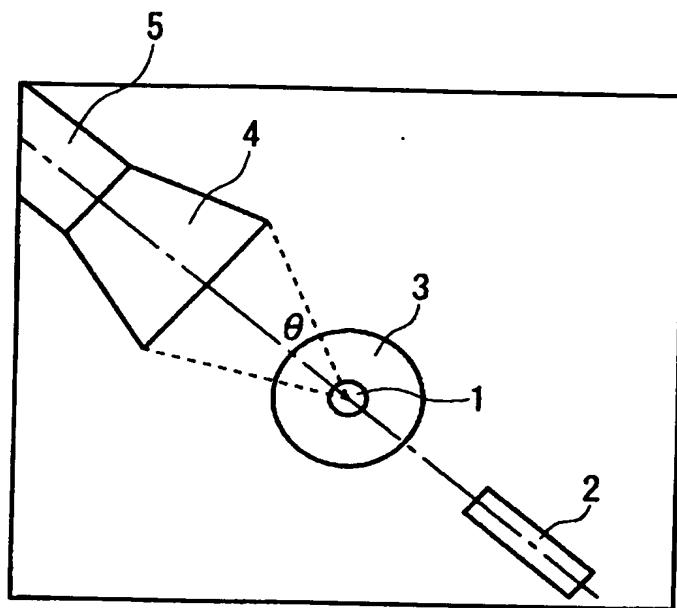


FIG. 1

PRIOR ART

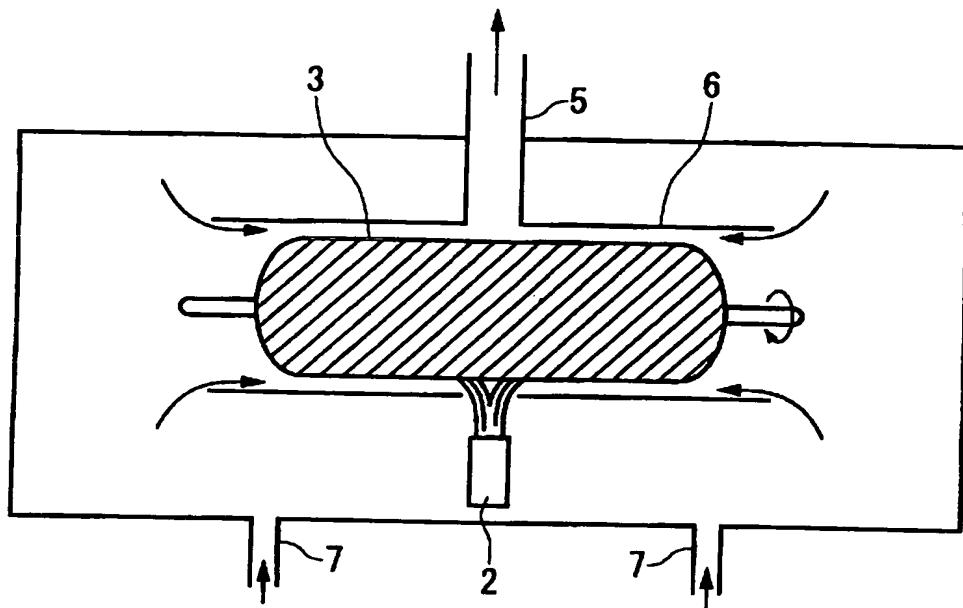


FIG. 2

PRIOR ART